

CLAIMS

What is claimed is:

1. An ultraviolet radiation-absorbing particle comprising:
 - (a) a core; and
 - 5 (b) a shell,wherein the shell encapsulates the core; and
wherein either the core or the shell comprises a conductive material,
said material having a negative real part of the dielectric constant
in a predetermined spectral band; and
10 wherein either
 - (i) the core comprises a first conductive material and the
shell comprises a second conductive material different
from the first conductive material; or
 - (ii) either the core or the shell comprises a refracting material
15 with a refraction index greater than about 1.8.
2. The particle of claim 1 wherein said particle exhibits an absorption cross-section
greater than 1 in a predetermined spectral band.
- 20 3. The particle of claim 1 wherein the particle is substantially spherical.
4. The particle of claim 3 wherein the particle has a diameter from about 1 nm to
about 150 nm.
- 25 5. The particle of claim 3 wherein the particle has a diameter from about 10 nm to
about 50 nm.
6. The particle of claim 1 wherein the shell thickness is from about 1 nm to about
20 nm.

7. The particle of claim 1 wherein either the core or the shell material is selected from a group consisting of Ag, Al, Mg, Cu, Ni, Cr, TiN, ZrN, HfN, Si, TiO₂, ZnO₂, Al₂O₃.
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8. The particle of claim 1 wherein both the core and the shell comprise conductive materials, and wherein the materials of the core and the shell are selected so that the particle exhibits a peak of absorption in a range of wavelengths from about 200 nm to about 320 nm.
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9. The particle of claim 1 wherein both the core and the shell comprise conductive materials, and wherein the materials of the core and the shell are selected so that the particle exhibits a peak of absorption in a range of wavelengths from about 320 nm to about 350 nm.
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10. The particle of claim 1 wherein both the core and the shell comprise conductive materials, and wherein the materials of the core and the shell are selected so that the particle exhibits a peak of absorption in a range of wavelengths from about 350 nm to about 400 nm.
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11. The particle of claim 1 wherein either the core or the shell comprises a refracting material with a refraction index greater than about 1.8, and wherein thickness of the shell and/or the size of the core are independently adjusted so that the particle exhibits a peak of absorption in a range of wavelengths from about 200
- 25
- nm to about 320 nm.
12. The particle of claim 1 wherein either the core or the shell comprises a refracting material with a refraction index greater than about 1.8, and wherein thickness of the shell and/or the size of the core are independently adjusted so that the

particle exhibits a peak of absorption in a range of wavelengths from about 320 nm to about 350 nm.

13. The particle of claim 1 wherein either the core or the shell comprises a refracting material with a refraction index greater than about 1.8, and wherein thickness of the shell and/or the size of the core are independently adjusted so that the particle exhibits a peak of absorption in a range of wavelengths from about 350 nm to about 400 nm.
14. A method of manufacturing a particle that absorbs electromagnetic radiation in the ultraviolet spectral band comprising the step of encapsulating a core with a shell, wherein either the core or the shell comprises a conductive material, said material having a negative real part of the dielectric constant in a predetermined spectral band; and wherein either
- (i) the core comprises a first conductive material and the shell comprises a second conductive material different from the first conductive material; or
 - (ii) either the core or the shell comprises a refracting material with a refraction index greater than about 1.8.
15. The method of claim 14 the core comprises a first conductive material and the shell comprises a second conductive material different from the first conductive material, and wherein the first and the second conducting materials are selected so that the particle exhibits a peak of absorption in a desired spectral band.
16. The method of claim 14 either the core or the shell comprises a refracting material with a refraction index greater than about 1.8, and wherein the thickness of the shell is selected so that the particles exhibits a peak of absorption in a desired spectral band.

17. An electromagnetic radiation-absorptive material for substantially blocking passage of the ultraviolet spectral band of radiation comprising:
 - (a) a carrier material; and
 - (b) a particulate material dispersed in the carrier material with a primary particle comprising a core and a shell encapsulating said core, and wherein either the core or the shell comprises a conductive material, said material having a negative real part of the dielectric constant in a predetermined spectral band; andwherein either
 - (i) the core comprises a first conductive material and the shell comprises a second conductive material different from the first conductive material; or
 - (ii) either the core or the shell comprises a refracting material with a refraction index greater than about 1.8.
18. The material of claim 17 wherein the carrier is selected from the group consisting of glass, polyethylene, polypropylene, polymethylmethacrylate, polystyrene, polyethylene terephthalate, and copolymers thereof.
19. The material of claim 17 further comprising one or more distinct particulate materials.
20. The material of claim 17 wherein the material is ink.
21. The material of claim 17 wherein the material is paint.
22. The material of claim 17, wherein the material is lotion.

23. The material of claim 17 wherein the material is gel.
24. The material of claim 17 wherein the material is film.
- 5 25. The material of claim 17 wherein the material is solid.
26. The material of claim 17 wherein the material is a textile.
- 10 27. The material of claim 17 wherein the material is a textile, textile-like, or a foam matrix selected from a group consisting of gauze, rayon, polyester, polyurethane, polyolefin, cellulose and its derivatives, cotton, orlon, nylon, and hydrogel polymeric materials.
- 15 28. The material of claim 27 wherein the material is attached to a self-adhering elastomeric bandage.
29. The material of claim 17 wherein the primary particles are further embedded in beads.
- 20 30. The material of claim 29 wherein the primary particles are individually embedded in substantially spherical beads.